an end effector attached to the distalmost link and being rotatable about an end effector axis;

a motor connected to rotate the end effector about the end effector axis to thereby provide a yaw motion; and

means for monitoring and controlling the yaw motion such that the end effector axis can be moved in a straight line which is not restricted to the radial direction, and wherein the means for monitoring and controlling the yaw motion moves the end effector in a straight line and maintains a constant orientation of the end effector.

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9. (Amended) A robotic arm structure providing θ motion and R motion about a primary axis, the arm structure comprising:

an end effector for transporting semiconductor substrates attached to the arm structure and being rotatable about an end effector axis;

a first motor connected to rotate the end effector about the end effector axis to provide a yaw motion;

a second motor connected to rotate the end effector to provide a roll motion of the end effector; and

means for monitoring and controlling the yaw and roll motions;

wherein the end effector has at least two hands such that the second motor rolls a first hand and a third motor rolls a second hand.

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11. (Amended) A robotic arm structure providing θ motion and R motion about a primary axis, the arm structure comprising:

an end effector for transporting semiconductor substrates attached to the arm structure and being rotatable about an end effector axis;

a first motor connected to rotate the end effector about the end effector axis to provide a yaw motion;

a second motor connected to rotate the end effector to provide a roll motion of the end effector;

a third motor connected to rotate the end effector to provide a pitch motion of the end effector; and

means for monitoring and controlling the yaw, roll, and pitch motion;

wherein the end effector has at least two hands.

14.
~~39~~. (Amended) A robotic arm structure providing θ motion and R motion about a primary axis, the arm structure comprising:

an end effector for transporting semiconductor substrates attached to the arm structure and being rotatable about an end effector axis;

a first motor connected to rotate the end effector about the end effector access to provide a yaw motion;

a second motor connected to rotate the end effector to provide a pitch motion of the end effector; and

means for monitoring and controlling the yaw and pitch motions;

wherein the end effector has at least two hands such that the second motor pitches a first hand and a third motor pitches a second hand.

In Claim 45, line 1, delete "Claim 44," and insert --Claim 31,--.

REMARKS

Reconsideration and allowance of the above-identified application are respectfully requested. Claims 1-7, 31, 35, 39, 45-47, and 49 are currently pending.

Rejections under 35 U.S.C. §103:

Claims 1-3, 49 and 50 have been rejected under 35 U.S.C. §103 as being unpatentable over Tabata et al. in view of Ueyama, et al.